CLAIMS

WE CLAIM:

1. An isolated polypeptide comprising a sequence selected from the group consisting of SEQ ID NO:2 and SEQ ID NO:2 carrying a conservative substitution, deletion or rearrangement at one or more non-critical amino acid position.

2. An isolated polynucleotide that encodes a polypeptide comprising a sequence selected from the group consisting of SEQ ID NO:2 and SEQ ID NO:2 carrying a conservative substitution, deletion or rearrangement at one or more non-critical amino acid position.

3. The isolated polynucleotide of claim 2 comprising SEQ ID NO:1.

4. The isolated polynucleotide of claim 2 operably linked to a non-native expression control sequence.

5. A cultured cell comprising a polynucleotide that encodes a polypeptide of Claim 1.

6. The cultured cell of Claim 5 comprising a polynucleotide that encodes a polypeptide that comprises a sequence selected from the group consisting of SEQ ID NO:2 and SEQ ID NO:2 carrying a conservative substitution, deletion or rearrangement at one or more non-critical amino acid position, the polynucleotide being operably linked to a non-native expression control.

7. An isolated nucleic acid comprising at least 20 contiguous nucleotides of SEQ ID NO:1 including at least one of a codon that encodes amino acid 558 and a codon that encodes amino acid 618.

8. An antibody that binds specifically to an immunogenic fragment of SEQ ID NO:2 that contains at least one of amino acid 558 and amino acid 618 of SEQ ID NO:2

9. A method for producing a polypeptide comprising a sequence selected from the group consisting of SEQ ID NO:2 and SEQ ID NO:2 carrying a conservative substitution, deletion or rearrangement at one or more non-critical amino acid position, the method comprising the step of culturing the cell of claim 6 under conditions permitting expression of the polypeptide.

10. A method for identifying an agent that can alter the activity of a sodium channel relative to a standard, the method comprising the steps of:

providing a cultured cell comprising a polynucleotide that encodes a polypeptide comprising a sequence selected from the group consisting of SEQ ID NO:2 and SEQ ID NO:2 carrying a conservative substitution, deletion or rearrangement at one or more non-critical amino acid position, the polynucleotide being operably linked to a non-native expression control sequence;

producing the polypeptide in the cell;

exposing the cell to the agent; and

determining the sodium channel activity of the cell, an alteration in sodium channel activity being an indication that the agent is an activity-altering agent.

11. The method of claim 10, wherein the determining step comprises the step of measuring a parameter selected from the group consisting of a sodium current across a cellular membrane, a membrane potential, and an intracellular sodium level.

12. The method of claim 10, wherein the alteration is a decrease in sodium channel activity.

13. The method of claim 10, wherein the alteration is a increase in sodium channel activity.

14. A method for determining whether a biological sample contains an hH1b form of a sodium channel α subunit, the method comprising the steps of:

contacting the sample with an hH1b-specific antibody; and

determining whether the antibody specifically binds to a component in the sample, said binding being an indication that the sample contains the hH1b form of the sodium channel α subunit.

15. A method for determining whether a human or non-human subject is at risk for Long QT syndrome, the method comprising the step of:

determining whether the subject carries an hH1b form of an *SCN5A* gene.